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[Title of the Invention] Recording material for printing, adhesive film, and printed laminated body

[Abstract]
[Problem] To provide a recording material for printing, an adhesive film using the material, and a printed laminated body that have a favorable durability, such as scratch resistance and weather resistance, and that are used as a marking film that can be incinerated and disposed of easily.

[Means for Solving the Problem] A recording material for printing, comprising: the printing base material (A)5 consisting of an acrylic resin film laminated on the mold release substrate 1; and the adhesive base material (B)6 substantially composed by the adhesive agent layer 3 in which white pigments are dispersed and in which one face is laminated with the printing face 21 provided by printing the acrylic resin film and the other face is laminated with a to-be-adhered material, wherein the adhesive agent layer 3 has a shape-retaining characteristic and one or both faces thereof are laminated with mold release films 4, 4'; and an adhesive film that is provided by laminating the adhesive agent layer 3 having a shape-retaining characteristic in which white pigments are dispersed with the printed acrylic resin film 2 so that the printed face of the printed acrylic resin film is abutted with the adhesive agent layer.

[Claims]

[Claim 1] A recording material for printing, characterized in comprising:

a printing base material (A) consisting of an acrylic resin film laminated on a mold release substrate; and

an adhesive base material (B) substantially composed by an adhesive agent layer in which white pigments are dispersed and in which one face is laminated with a printing face provided by printing the acrylic resin film (A) and the other face is laminated with a to-be-adhered material,

wherein the adhesive agent layer has a shape-retaining characteristic and one or both faces thereof are laminated with a mold release film.

[Claim 2] A printing base material (A) used for the recording material for printing according to Claim 1, characterized in consisting of an acrylic resin film laminated on a mold release substrate.

[Claim 3] An adhesive base material (B) used for the recording material for printing according to Claim 1, characterized in being provided by laminating both faces or one face of an adhesive agent layer having a shape-retaining characteristic with a mold release film.

[Claim 4] An adhesive film, characterized in being provided by laminating an adhesive agent layer having a shape-retaining characteristic in which white pigments are dispersed with a printed acrylic resin film so that the printed face of the printed acrylic resin film is abutted with the adhesive agent layer.

[Claim 5] A printed laminated body, characterized in being provided by laminating an adhesive agent layer laminated on a to-be-adhered material having a shape-retaining characteristic in which white pigments are dispersed with a printed acrylic resin film so that the printed face of the printed acrylic resin film is abutted with the adhesive agent layer.

[Detailed Description of the Invention]

[0001]

[Field of the Invention]

The present invention relates to a recording material for printing and an adhesive film using such, and to a printed laminated body. Specifically, the present invention relates to a recording material for printing, an adhesive film, and a printed laminated body that are suitable as a marking film for decorating an outdoor and indoor advertising sticker or as an indication sticker, for example.

[0002]

[Prior Art]

An adhesive film used as a sticker, for example for displaying an advertisement outdoors or indoors, for indication, or for decoration is generally refered to as a "marking film". This marking film is generally provided such that a vinyl chloride-base resin film as the base material 12 as shown in Fig. 4 is optionally subjected to printing and painting and then one face is painted with a pressure-sensitive adhesive agent appropriate to the intended application, to provide the adhesive agent layer 13. Then, for the purpose of protecting the adhesive agent layer, the face is bonded

with the release material 14 (e.g., release paper). In the use, this release material is released and is bonded at a predetermined position.

[0003]

In actual practice, the marking film as described above is frequently used outdoors, and is thus required to have superior durability as well as appropriate flexibility. Furthermore, recent rapid development of information-related technology (e.g., computers) has made possible the diffusion of pigment type output devices using an image output method that considers the weather resistance in an ink jet printer, a thermal transfer printer, an electrostatic plotter, or the like. Thus, this method has come to be that most widely used for printing the marking film onto a base material.

[0004]

However, in contrast to a staining method using dye, the pigment type output method as described above does not allow ink to permeate the resin of a base material, thus causing pigment particles to form a printing layer having only the height of few μm as a collective product including a binder component. This layer is bonded to the surface and is exposed. This has caused a problem that sufficient scratch resistance or the like is not easily obtained. For this reason, problems have arisen that the practice is time-consuming or the cost is increased because, in order to secure the scratch resistance or weather resistance of the printing layer, the step for bonding the layer to the surface must follow or must be followed by a step for subjecting the surface of the printing layer to a top coat processing or a step for bonding the surface with the over laminate base material 22 including the adhesive agent layer 23 in Fig. 5. Furthermore, when the material is subjected to top coat processing, a coating material of fluxing material is generally used. Thus, a large amount of fluxing material must be used when manufacturing the displayed matter. This has caused other problems that the working environment is deteriorated and the fluxing material tends to permeate the base material of the marking film and thus is easily absorbed by the base material, thus leaving the odor of the fluxing material even after the completion of the preparation.

[0005]

In the case of the conventional marking film on the other hand, a vinyl chloride-base resin film has been mainly used as a base material. This has caused a problem that hydrochloric gas is created due to the incineration and disposal to deteriorate an equipment durability or that reducing the generation of dioxin is difficult in a simple incineration equipment. Thus, demands have been growing for a marking film that can be processed by simple incineration equipment and that can reduce the load to an environment. For example, Japanese Laid-Open Publication No. 9-254327

suggests a marking film using a polyolefin-base resin film as a base material that can be incinerated and disposed of easily. In this marking film, the base material layer is provided by forming a film of ethylene-α-olefin copolymer having a specific property obtained by the polymerization by a metallocene catalyst.

[0006]

However, although the marking film according to the above publication is superior in reducing the burden on the environment, the base material uses the specific olefin copolymer obtained by the special catalyst and the face at which this base material is exposed has thereon a printing layer. This structure has caused a practical problem that, in order to secure the abrasion resistance or weather resistance of the printing layer, the over laminate base material 22 is also required in this case, finally causing a relatively high cost.

[0007]

[Problem to be Solved by the Invention]

During a process in which the inventor of the present invention was involved in serious research of the above-described problems of the conventional adhesive film, the inventor conceived of the present invention by viewing from a different angle the conventional fixed concept according to which one face of the base material of the marking film on which no adhesive agent layer is provided should be printed to change the laminating process such that the printed face is abutted with the adhesive agent layer. Specifically, it is an object of the present invention to provide a recording material for printing, an adhesive film using the material, and a printed laminated body that provide favorable durability (e.g., scratch resistance, weather resistance) without requiring a processing (e.g., over laminate, top coat), that can be easily incinerated and disposed of, and that may be provided at a low cost.

[0008]

[Means for Solving the Problem]

The recording material for printing according to Claim 1 is characterized in comprising the printing base material (A) consisting of an acrylic resin film laminated on a mold release substrate; and the adhesive base material (B) substantially composed by an adhesive agent layer in which white pigments are dispersed and in which one face is laminated with a printing face provided by printing the acrylic resin film (A) and the other face is laminated with a to-be-adhered material, wherein the adhesive agent layer has a shape-retaining characteristic and one or both faces thereof are laminated with a mold release film. The printing base material (A) according to Claim 2 is the printing base material (A) used for the recording material for printing according to Claim 1 that

is characterized in consisting of an acrylic resin film laminated on a mold release substrate. The adhesive base material (B) according to Claim 3 is the adhesive base material (B) used for the recording material for printing according to Claim 1, characterized in being provided by laminating both faces or one face of an adhesive agent layer having a shape-retaining characteristic with a mold release film. The adhesive film according to Claim 4 is characterized in being provided by laminating an adhesive agent layer having a shape-retaining characteristic in which white pigments are dispersed with a printed acrylic resin film so that the printed face of the printed acrylic resin film is abutted with the adhesive agent layer. The printed laminated body according to Claim 5 is characterized in being provided by laminating an adhesive agent layer laminated on a to-be-adhered material having a shape-retaining characteristic in which white pigments are dispersed with a printed acrylic resin film so that the printed face of the printed acrylic resin film is abutted with the adhesive agent layer.

[0009]

Hereinafter, the present invention will be described in detail. The printing base material (A) in the present invention consists of an acrylic resin film laminated on a mold release substrate. The mold release substrate has a function as a supporting body for preventing, when the acrylic resin film is printed, the film from being elongated or wrinkled and a function as a protecting body for preventing, after the printing, the film from being scratched or contaminated. The material thereof is not limited to a particular material and may be any material having the functions as described above. The material preferably includes, for example, polyester resin film (particularly polyethylene terephthalate film).

[0010]

The acrylic resin film is not limited to a particular material and preferably includes, for example, polymethacrylate ester (e.g., polymethylmethacrylate, ethyl polymethacrylate), conventionally-known copolymer (e.g., copolymer of polyacrylic ester or polymethacrylate ester with synthetic rubber), or acrylic urethane-base resin obtained by linking acrylic polyol by polyisocyanate cross-linking agent. Most preferably, acrylic urethane resin film is used.

[0011]

Acrylic polyol in the above acrylic urethane-base resin is not particularly limited. However, such acrylic polyol is preferable that has a superior weather resistance by the weight-average molecular weight of 1000 to 200000 and the glass-transition temperature (Tg) of 0 to 100 degrees. Polyisocyanate cross-linking agent preferably includes, for example, trimethylolpropane adduct, biuret material, or

isocyanurate material of hexamethylene diisocyanate or the mixture thereof or the condensation product thereof for the superior weather resistance. Such polyisocyanate cross-linking agent is more preferable that has a distance between cross-linkage points (NCO cardinal number of weight-average molecular weight/ polyisocyanate of polyisocyanate) of 200 to 400, and that is used in the range of 30 to 100 weight percent of an addition amount.

[0012]

Acrylic resin for providing the above acrylic resin film may be optionally added with a light stabilizer (particularly hindered amine-base light stabilizer or HASL is preferable) or a stabilizer (e.g., ultraviolet absorber, antioxidant).

[0013]

In the above printing base material (A), the total thickness including the mold release substrate and the acrylic resin film is not particularly limited but is preferably 20 to 160 μm. When the thickness is smaller than 20 μm, the sheet has a reduced hardness, which impairs workability. When the thickness exceeds 160 μm, the capability to follow a cubic curved surface tends deteriorate.

[0014]

The method used for laminating the acrylic resin film is not particularly limited. However, methods include, for example, a method of using a device (e.g., gravure coater , comma coater, reverse coater, knife coater, spray gun) to laminate the film on a mold release substrate. A device for printing the acrylic resin film preferably includes, for example, a device for outputting pigments (e.g., ink jet printer, thermal transfer printer, electrostatic plotter). However, the device is not limited to these.

[0015]

The adhesive base material (B) in the present invention is substantially composed by an adhesive agent layer in which white pigments are dispersed and in which one face is laminated with a printing face provided by printing the acrylic resin film (A) and the other face is laminated with a to-be-adhered material, wherein the adhesive agent layer has a shape-retaining characteristic and one or both faces thereof are laminated with a mold release film.

[0016]

An adhesive agent for providing the above adhesive agent layer is not particularly limited and may be any of an acrylic resin-base adhesive agent or a rubber-base adhesive agent. However, when considering outdoor use as a marking

film, an acrylic resin-base adhesive agent is preferable due to the superior weather resistance.

[0017]

A (meta) acrylic acid ester monomer used as a main component of the above acrylic resin-base adhesive agent includes, for example, alcohol (meta) acrylic acid ester having alkyl group having a carbon number of 1 to 12 and preferably (meta) acrylic acid ester having an alkyl group having a carbon number of 4 to 12. Specifically, a (meta) acrylic acid ester monomer can include (meta) acrylic acid n-butyl, (meta) acrylic acid 2-ethyl hexyl, (meta) acrylic acid iso-octyl, (meta) acrylic acid n-octyl, (meta) acrylic acid isononyl, or (meta) acrylic acid lauryl. These can be used separately or in combination.

[0018]

When the above (meta) acrylic acid ester monomers are used in combination, from the viewpoint of the balance between adhesive and aggregation, it is preferable that lower alcohol (meta) acrylic acid ester is generally used together that includes (meta) acrylic acid ester of homopolymer having a glass-transition temperature (Tg) equal to or lower than –50 degrees as a main component (e.g., (meta) acrylic acid methyl, (meta) acrylic acid ethyl). In addition to these (meta) acrylic acid ester monomers, other monomers that can be copolymerized with them also may be used.

[0019]

The above monomers include, for example, a carboxyl group-containing monomer (e.g., (meta) acrylic acid, maleic acid, fumaric acid , itaconic acid) or the anhydride thereof and a hydroxyl group-containing monomer (e.g., 2-hydroxyethyl (meta) acrylate, 4-hydroxybutyl acrylate, polyoxyethylene (meta) acrylate, polyoxypropylene (meta) acrylate, caprolactone metamorphism (meta) acrylate).

[0020]

The above adhesive agent may be a fluxing material-type acrylic adhesive agent polymerized in solvent, or may be an emulsion-base adhesive agent polymerized in water. The above adhesive agent also may be a mass polymerization type adhesive agent obtained by subjecting a monomer mixture to ultraviolet radiation.

[0021]

White pigment dispersed in the above adhesive agent is not particularly limited and preferably includes, for example, titanium oxide or the like. An amount of addition of the above white pigment is not particularly limited and is preferably 3 to 50

weight percent of a solid content ratio in the adhesive agent. When the addition amount is smaller than 3 weight percent, white coloration is weak and defective hue tends to be caused in the printing. When the addition amount exceeds 50 weight percent, the adhesive or the shape-retaining characteristic is deteriorated. The thickness of the above adhesive agent layer is not particularly limited and is preferably 20 to 50 μm from the viewpoint of the shape-retaining characteristic or the capability to follow a curved surface.

[0022]

In the above adhesive agent layer, one or both faces thereof are laminated with a mold release film. The mold release film is not particularly limited and includes, for example, a film that is obtained by coating a film or a paper for example consisting of a thermoplastic resin (e.g., polyester, polyolefin (e.g., polyethylene terephthalate)) with a mold release agent consisting of silicone or polyolefin-base wax.

[0023]

The thickness of the mold release film is not particularly limited and is generally about 25 to 200 μm. When the above thickness is too small, the mold release film has a reduced hardness, which causes wrinkles when the film is peeled or difficulties in handling the film. When the above thickness is too large, tunneling may be caused when a roll-shaped product is stored, or the scroll is opened because of the different circumferences in the laminated part. However, the thicknesses of the printing face of the printing base material (A) and the mold release film ("4" which will be described later) to be laminated therewith preferably have a certain amount of thickness (50 to 200 μm) in view of the practice in which an adhesive agent layer is pressed and laminated during the peeling. The thickness of the other mold release film is preferably 25 to 50 μm from the viewpoint of the necessity for a roll-shaped product or for a lower cost.

[0024]

The above adhesive base material layer (B) can be manufactured by a general coating method. For example, the adhesive base material layer (B) can be manufactured by a quantitative coating method (e.g., reverse coat method) for coating an adhesive agent to the above mold release film to heat and dry the film.

[0025]

The adhesive film of the present invention is provided by laminating a printed acrylic resin film on an adhesive agent layer having a shape-retaining characteristic and having dispersed white pigments such that the adhesive agent layer is abutted with the

printed face of the printed acrylic resin film. Here, the details of the white pigments, adhesive agent layer, and acrylic resin film are completely the same as those described for the above-described material for printing and recording. As described later, a product is provided in a manner in which the acrylic resin film is generally laminated with a mold release substrate and the adhesive agent layer is laminated with the mold release film.

[0026]

The printed laminated body of the present invention is provided by laminating an acrylic resin film on an adhesive agent layer that is laminated to a to-be-adhered material, that has a shape-retaining characteristic, and that includes dispersed white pigments so that the adhesive agent layer is abuts the printed face of the acrylic resin film.

[0027]

The details of the white pigments, adhesive agent layer, and acrylic resin film in the above printed laminated body are completely the same as those described for the above-described material for printing and recording. A to-be-adhered material in the above adhesive agent layer can include, for example, signs of various materials, including a hard acrylic resin plate, a painted steel plate, a metal plate (e.g., aluminum) or a glass plate.

[0028]

The above printed laminated body is obtained, for example, by preparing an adhesive film on which an adhesive agent layer is laminated on a face of the printing base material (A) printed with the acrylic resin-base film while peeling the mold release film of the adhesive base material (B) to further peel the mold release film to adhere the film to the above to-be-adhered material. The above mold release substrate is peeled when used, simultaneously with the adhesive to the to-be-adhered material, prior to the adhesive, or after an appropriate period of time has elapsed.

[0029]

[Embodiment of the Invention]

Hereinafter, an embodiment of the present invention will be described with reference to the drawings. Fig. 1 is a schematic cross-sectional view illustrating an example of the recording material for printing of the present invention. Fig. 1(a) is a schematic cross-sectional view illustrating an example of the printing base material (A) in the present invention. Fig. 1(b) is a schematic cross-sectional view illustrating an example of the adhesive base material (B) in the present invention. The material for

printing and recording of the present invention includes the printing base material (A)5 consisting of the acrylic resin film 2 laminated on the mold release substrate 1 and the adhesive base material (B)6 obtained by laminating both faces of the adhesive agent layer 3 with the mold release films 4, 4′. Fig. 2 is a schematic cross-sectional view illustrating an example of an adhesive film in the present invention. Fig. 3 is a schematic cross-sectional view illustrating an example of a printed laminated body of the present invention.

[0030]

When the above recording material for printing is used as an adhesive film, the acrylic resin film surface (to-be-printed face 21) of the printing base material (A)5 is subjected to an arbitrary printing (e.g., printing for decoration) as required. Then, a face of the adhesive base material (B)6 from which the to-be-laminated side mold release film (hereinafter may be referred to as the to-be-laminated side) 4 is peeled is laminated on the printed face 21 so that this face is abutted with the printed face 21, thereby preparing the adhesive film 7 having the printing layer 24 as shown in Fig. 2. Furthermore, the mold release film 4′ laminated on the obtained adhesive film is peeled and is adhered to the to-be-adhered material 8 (e.g., sign). Then, the mold release substrate 1 is peeled to provide the printed laminated body as shown in Fig. 3. Although the printing layer 24 is schematically shown as a layer having a fixed thickness, the portion having no pattern or the like is not coated with a coloring agent (e.g., pigment).

[0031]

(Effect)

The recording material for printing of the present invention is mainly characterized in viewing, from a different angle, the conventional concept according to which one face of a marking film on which no adhesive agent layer is laminated is printed so that the printed face is laminated with the adhesive agent layer so as to be abutted with the adhesive agent layer. Specifically, the recording material for printing of the present invention includes the printing base material (A) and the adhesive base material (B) as described above so that, when being used as a marking film in outdoor applications, the face of the above printing base material (A) that is printed with an acrylic resin film is laminated with the adhesive base material (B) from which a mold release film is peeled. As a result, exposure of the printed face to the outdoor environment is prevented and the printed face is protected by the acrylic resin film, thus providing a favorable long-term durability (e.g., scratch resistance). Furthermore, compared with the conventional marking film for which an over laminate processing has been required in order to secure scratch resistance or weather resistance, the

recording material for printing of the present invention requires fewer constituent layers and thus may be provided at a lower cost.

[0032]

Because the above printing base material (A) uses an acrylic resin film, favorable weather resistance can be provided. Furthermore, the above adhesive base material (B) uses an adhesive agent in which white pigments are dispersed and thus hue in a printed material is stabilized, thus providing favorable coloration.

[0033]

The adhesive film and the printed laminated body of the present invention are provided such that an adhesive agent layer is laminated with a printed face of an acrylic resin film so that the former is abutted with the latter. Thus, the printed face is prevented from being exposed to the outdoor environment, thus providing favorable long-term durability, as in the above case.

[0034]

[Examples]

Hereinafter, the present invention will be specifically described by showing an Example and Comparison Examples with reference to Fig. 1. It is noted that the present invention is not limited to only the examples described below.

(Example)

<Preparation of printing base material (A)>

The acrylic resin film 2 was prepared by adding and mixing acrylic urethane-base resin ("PURANITTO U#700"made by DAI NIPPON TORYO, CO., LTD) of 100 parts by weight; a cross-linking agent of polyisocyanate cross-linking agent ("Collonate HL"made by NIPPON POLYURETHANE INDUSTRY CO., LTD) of 6.5 parts by weight; Hindered Amine Light Stabilizer ("TINUVIN 622" made by Ciba Specialty Chemicals) of 0.2 parts by weight; and ultraviolet absorber ("TINUVIN 327" made by Ciba Specialty Chemicals) of 0.2 parts by weight to use a reverse coater to paint the material on the mold release substrate 1 (PET film having a thickness of 38 μm) to dry and cure the resultant material, thereby providing the printing base material (A)5 of a thickness of 78 μm having a transparent acrylic urethane resin film of a thickness of 40 μm.

[0035]

<Preparation of adhesive base material (B)>

In ethyl acetate fluxing material, a mixture having the composition of BA

(acrylic acid n-butyl) of 60 weight percent, 2EHA (acrylic acid 2-ethyl hexyl) of 28 weight percent, AA (acrylic acid) of 11.7 weight percent, and HEMA (2-hydroxyethyl meta acrylate) of 0.3 weight percent was polymerized at its boiling point with AIBN (2,2′-azobisisobutyronitrile) as an initiator, thereby preparing an adhesive agent consisting of a copolymer of the solid content of 35 weight percent, an average molecular weight of 700,000, and Mw/Mn (molecular weight distribution) of 3.1. The obtained adhesive agent of 100 part by weight was added and mixed with white pigment of titanium oxide (average grain size of about 1 μm) of 20 part by weight, thereby providing an adhesive agent including dispersed white pigments to be supplied to the adhesive agent layer 3.

[0036]

The adhesive agent obtained by the above process was coated on the mold release film 4 (a silicon-coated release paper having a thickness of 100 μm) using a comma coater so as to have a thickness after drying of 40 μm. Then, the mold release film 4′ (which is a silicon-coated PET film having a thickness of 25 μm) was laminated to provide the adhesive base material (B)6.

[0037]

<Preparation of adhesive film >

A thermal transfer printer ("DURAROM" made by YE Data Inc.) was used to print on the face of the printing base material (A)5 obtained by the above process on which the mold release substrate 1 of the acrylic urethane resin film was not laminated (to-be-printed face 21). Then, one mold release film 4 (which is a silicon-coated release paper having a thickness of 100 μm) of the above adhesive base material (B)6 was laminated on the printed face while peeling the mold release film 4 so that the above adhesive base material (B)6 abutted with the printed face (to-be-printed face 21). Then, the mold release substrate (which is a PE film having a thickness of 38 μm) and the silicon-coated PET film having the thickness of 25 μm were peeled, thereby obtaining a sample of the adhesive film 7.

[0038]

(Comparison example 1)

The same thermal transfer printer as that of the above example in which the silicon mold release paper was peeled was used to print on a surface of a commercially-available vinyl chloride resin-base marking film [TUCKPAINT TP02" made by SEKISUI CHEMICAL, CO.,LTD., a base material layer: titanium oxide-including vinyl chloride resin (thickness 50μm)/adhesive agent layer: acrylic adhesive agent (thickness 30μm)/silicon mold release paper (160μm)] as a conventional

marking film for printing , thereby providing a sample of an adhesive film.

[0039]

(Comparison example 2)

As in the case of the above comparison example 1, the marking film was printed and a mold release film was peeled to subsequently bond this face with a laminate film for an over laminate processing ["SIL131" made by SEKISUI CHEMICAL, CO.,LTD., transparent vinyl chloride resin (50 μm)/acrylic resin-base adhesive agent (30 μm)/mold release film (PET, 25 μm)]. Thereafter, a silicon mold release paper (160 μm) was further peeled, thereby providing a sample of an adhesive film.

[0040]

The adhesive film sample obtained by the above process was evaluated as shown below.

<Incineration possibility >

A 5cm×5cm-sized sample was cut from the adhesive film sample and was burned in a sealed container while taking the combustion gas into a syringe. Then, the combustion gas was subjected to a qualitative analysis by a gaschromatograph with regards to hydrogen chloride and chlorine gas and was evaluated based on the evaluation criteria as shown below.

○: No hydrogen chloride or chlorine gas were detected.
×: Hydrogen chloride and chlorine gas were detected.

The results of the evaluation are shown in Table 1.

[0041]

[Table 1]

	Example	Comparison example 1	Comparison example 2
Incineration possibility	○	×	×

In the Example of the present invention, neither hydrogen chloride nor chlorine gas were detected.

[0042]

<Coloration>

The adhesive film samples obtained by Example and Comparison examples 1 and 2 were measured by a spectrophotometry device ("CM-3700" made by MINOLTA). The color measurement was performed so that parts in which the respective system colors of the printer of C(Cyan),M(Magenta), Y(Yellow), and K(Black) are separately printed were measured. The results of the measurement are shown in Table 2. In Table 2, "L*", "a*", and "b*" indicate the values measured using the LAB color system of CIE (International Commission on Illumination).

[0043]

[Table 2]

As can be seen from Table 2, the Example of the present invention shows measurement results equal to those of Comparison examples 1 and 2, demonstrating that its performance is equal to that of conventional products.

	Example			Comparison example 1			Comparison example 2		
	L*	a*	B*	L*	a*	b*	L*	a*	b*
C	51.49	-15.15	-48.79	51.51	-15.13	-48.63	51.51	-15.14	-48.60
M	47.17	63.90	2.69	47.30	63.85	2.65	47.20	63.80	2.64
Y	89.30	-14.52	86.46	89.35	-14.47	86.47	89.30	-14.48	86.47
K	26.85	0.11	-0.56	26.84	0.12	-0.55	26.84	0.11	-0.56

[0044]

<Weather resistance >

The adhesive film samples obtained by Example and Comparison examples 1 and 2 were subjected to a laboratory weathering by a carbon arc sunshine weatherometer for 2000 hours. Then, the color difference after the weathering was measured by a spectrophotometry device ("CM-3700" made by MINOLTA). The measurement result is shown in Table 3.

[0045]

[Table 3]

	Example				Comparison example 1				Comparison example 2			
	L*	a*	b*	ΔE	L*	a*	b*	ΔE	L*	a*	b*	ΔE
C	51.60	-15.30	-48.10	0.72	52.01	-18.30	-48.30	3.23	51.60	-15.14	-48.60	0.09
M	47.30	64.50	2.50	0.54	50.98	58.93	-8.21	12.80	47.80	83.80	2.64	0.60
Y	89.20	-14.23	85.50	1.01	92.20	-14.45	45.72	40.84	89.50	-14.45	84.50	1.98
K	26.40	0.11	-0.65	0.45	25.97	0.05	-0.93	0.95	26.50	0.11	-0.55	0.34

As can be seen from Table 3, the sample having no over laminate processing shown in Comparison example 1 shows a significant color difference value (ΔE) while the Example shows only a small color difference, as in the case of the conventional product with an over laminate processing (Comparison example 2), thereby demonstrating a superior weather resistance.

[0046]

[Effect of the Invention]

The recording material for printing of the present invention includes the specific printing base material (A) and the specific adhesive base material (B). As a result, when this recording material is used outdoors as an adhesive film, the face of the above printing base material (A) printed with an acrylic resin film is laminated with the adhesive base material (B) from which a mold release film is peeled. Consequently, exposure of the printed face to the outdoor environment is prevented, and the printed face is protected by the acrylic resin film, thus providing favorable long-term durability (e.g., scratch resistance). The printing base material (A) using an acrylic resin film enables the material to have a superior weather resistance and to be incineratable and disposable using simple incineration equipment. Furthermore, the necessity for conventional processings for the purpose of the protecting a surface (e.g., over laminate, top coat) is eliminated, thus reducing the number of constituent materials and process steps. As a result, this material can be obtained at a lower cost and without the need for an operation using an organic fluxing material. Thus, a low environmental load-type recording material for printing and an adhesive film using it, as well as a printed laminated body, can be provided.

[Brief Description of the Drawings]

[Fig. 1] Schematic cross-sectional view illustrating an example of the recording material for printing of the present invention.

[Fig. 1(a)] Schematic cross-sectional view illustrating an example of the printing base material (A) in the present invention.

[Fig. 1(b)] Schematic cross-sectional view illustrating an example of the adhesive base material (B) in the present invention.

[Fig. 2] Schematic cross-sectional view illustrating an example of an adhesive film in the present invention.

[Fig. 3] Schematic cross-sectional view illustrating an example of the printed laminated body of the present invention.

[Fig. 4] Schematic cross-sectional view illustrating an example of a conventional marking film.

[Fig. 5] Schematic cross-sectional view illustrating an example of a conventional adhesive film for an over laminate processing.

[Description of Reference Numerals]

1	Mold release substrate
2	Acrylic resin film
21	To-be-printed face
24	Printing layer
3	Adhesive agent layer
4	Mold release film (to-be-laminated side)
4′	Mold release film
5	Printing base material (A)
6	Adhesive base material (B)
7	Adhesive film
8	To-be-adhered material